IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Lane W. Lee and Michael B. Propps		
Assignee:	DPHI Acquistions, Inc.		
Title:	Method and Apparatus for Emulating Read/Write File System on a Write-Once Storage Disk		
Application No.:	**09/583,133**	Filing Date:	May 30, 2000
Examiner:	**Luke S. Wassum**	**Group Art Unit:**	**2177**
Docket No.:	M-8377 US	Confirmation No.:	1855

Irvine, California
February 14, 2005

Via Facsimile to (703) 872-9306

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I hereby certify that the following documents are being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below:

1) **Transmittal Letter (1 page); and**

2) **Appellants' Opening Brief (10 pages).**

Dated: February 14, 2005

Jonathan W. Hallman
Registration No. 42,622

Number of pages (including this sheet): **12**

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Dear Sir:

Transmitted herewith are the following documents in the above-identified application:

(1) This Transmittal Letter (1 page); and
(2) Appellants' Opening Brief (10 pages).

☒ The fee has been calculated as shown below:

☒ Fee for Filing Brief in Support of an Appeal (SMALL ENTITY) $ 250.00

☒ Conditional Petition for Extension of Time: If an extension of time is required for timely filing of the enclosed document(s) after all papers filed with this transmittal have been considered, an extension of time is hereby requested.

☒ **Please charge our Deposit Account No. 50-2257 in the amount of $ 250.00**

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Linda Bolter
Linda Bolter

February 14, 2005
Date of Signature

Respectfully submitted,

Jonathan W. Hallman
Attorney for Applicant
Reg. No. 42,622

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Lane Lee

Application No. 09/583,133

Filing Date: 5/30/2000

For: Method and Apparatus For Emulating Read/Write File System on a Write-Once Storage Disk

Examiner: Luke S. Wassum

Art Unit: 2177

Attorney Docket No.: M-8377 US

APPELLANTS' OPENING BRIEF

Real Party In Interest

The real party in interest is DPHI Acquisitions, the present assignee of US Application No. 09/853,133.

Related Appeals and Interferences

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims

Claims 2-9, 20, and 24-26 are pending and are finally rejected.

Claims 1, 10-19, 21-23, and 27-35 are cancelled.

The rejection of claims 2-9, 20, and 24-26 is appealed.

Status of Amendments

No amendments have been filed since the final rejection.

Summary of Claimed Subject Matter

The present invention relates to the emulation of an erasable storage medium using a write-once read-many (WORM) optical disk.

As discussed by the Applicants with respect to Figures 3, 3a, and 3b, a WORM optical disk includes a writeable area (element 310) that is subdivided into a writable data area (element 322) and a writeable system area (element 320). The writable data area includes the content a user is interested, which is organized as "file system objects." In contrast, the system area is used to record "system sectors" that are used "to locate and access content information for files system objects." (Page 13, lines 10-11).

As known in the arts, the writable area on the disk comprises a spiral track (or it may also comprise concentric circular tracks that do not form a spiral). The writeable data area and the writable system area are organized at opposite ends of the track. For example, as seen in Figure 3, the writable data area can be arranged to start at an outer diameter of the writable area and continue towards the inner diameter. Conversely, the writable system area may start at an inner diameter of the writable area and continue towards the outer diameter. As files system objects are written to the disk, eventually the writable system area and the writable data areas will merge as seen in Figures 3a and 3b. However, the arrangement of placing the writable system area and the writeable data area at opposite ends of the track allows for an efficient disk use. For example, as seen in Figure 3a, the storage of many small files means that the writeable system area will be larger than the data area. Conversely, the storage of a few large files means that the writable data area will be larger than the system area. In this fashion, the available writable disk space is used very efficiently.

The arrangement of the writeable data and system areas is not the only innovation presented by the Applicants. As discussed with respect to Figure 4, the writeable system area may be viewed conceptually as a "media stack." At the top of this stack is the system sector information for the most recently changed or added file system objects. System sectors within the stack progressively describe older and older data files. As set forth on page 19, line 3

through page 22, line 9, such an arrangement provides for an optimized reading of file system objects. For example, Figure 7 illustrates three system sectors: system sector 702 being the most recently written, system sector 704 being the next-to-most recently written, and system sector 706 being written prior to sector 704. Sector 706 includes the entry information (such as location and size) to access the following file system objects: data files A, B, C, D, and directories X, Y, and Z. As a result of updates, system sector 704 includes the access information for data files B and directory X. As a result of yet more updates, system sector 702 has the access information for files A and C as well as directory X.

Given the system sector architecture provided by the Applicants, a storage engine need only read the top of the media stack (system sector 702) to access files A, C, or directory X. To access file B or directory Y, the engine would have to further read system sector 704. Finally, to access file D or directory Z, the engine would have to read through to the bottom of the stack (system sector 706). Because the updated system sectors (702 and 704) address only the updated files, the disk space usage is optimized. Moreover, the access of files is also optimized in that a user will typically desire access to the most recently changed data files rather than older files, an access that is faster because the corresponding system sector information is at the top of the media stack.

Grounds of Rejection to Be Reviewed on Appeal

1) Whether, under 35 U.S.C. § 103(a), claims 2 – 9, 20, and 24 -- 26 are unpatentable over U.S. Patent No. 4,827,462 to Flannagan, et al. in view of U.S. Patent No. 5,630,115 to Mikamo.

Argument

Given the rather lengthy prosecution history for this application, the issues on appeal are fairly well-defined. For example, the Applicants agree with the Examiner that the Flannagan reference (USP 4,827,462) discloses the arrangement of a data at one end of a spiral track on a disk and directory information at another. However, as set forth above, such an arrangement is not the only aspect of the Applicants' invention. In addition, the Applicants have provided the advantageous system sector architecture (the media stack discussed above). For example, consider claim 2, which includes the acts of:

"writing a plurality of data files in the writing area, wherein a first data file is written from a first end of the spiral track, a second data file is written from the end of the first data file on the spiral track, and so on for remaining data files;

generating a system sector for the data files, wherein the system sector identifies, for each data file, its location in the writable area and its size;

writing the system sector in the writable area, wherein the system sector is written from the remaining end of the spiral track;

generating an updated system sector whenever there is a change in the data files stored on the writable area, wherein the updated system sector identifies only the changed data files, the unchanged data files being identified by the system sector; and

writing the updated system sector in the writable area, wherein the updated system sector is written from the end of the system sector on the spiral track."

As can be seen from these acts, the updated system sector is written from the end of the [previously-written] system sector. Thus, it will be the first system sector information accessed by a storage engine. Just as in the previously-described example, this updated system sector identifies <u>only</u> the changed data files. As such the updated system sector not only efficiently uses disk space but also optimizes file access as discussed above.

Applicants agree with the Examiner that the Flannagan reference does not teach or suggest the acts of forming an updated system sector. However, to

provide this missing teaching, the Mikamo reference (USP 5,630,115) has been cited. Mikamo discloses a storage medium having a directory space 2 and a data space 3 as seen in Figure 1. As set forth with respect to Figure 2, a file may be changed such that only certain portions (new.rec2 and new.rec3) are changed. Rather than rewrite the entire file, only these changed portions are written to the data portion 3 as discussed with respect to Figure 4. But notice that the Mikamo analog of the "system sector" is written to the data portion 3. As seen in Figure 4, the "record position" information of the changed file is written in data portion 3. All the directory space 2 has is a pointer to this record position information. Thus, Mikamo is fundamentally opposed to the teachings of both the present application and the Flannagan reference: Mikamo does not practice the separation of data files from the corresponding system sector information (a "system sector" as set forth in claim 2 must identify both the size and the location of the corresponding file system object). The pointer in the directory space of Mikamo neither identifies the size nor provides the location; it simply points to the location information ("record position" in Figure 4) which resides in the data area 3.

Applicants respectfully note that the assertion in the September 13, 2004 office action that Figures 3b, 6b, and 11b disclose "updated system sectors" is in accord with this flaw of Mikamo. For example, Figure 3b is describing the position information of the corresponding data tracks – see, e.g, the description of Figures. The same is true of Figure 6b and 11b as well. Although this "updated system sector" information does not satisfy the definition of a system sector in claim 2 in that it does not identify size, positional information shown in these figures is written to the data portion 2 as seen in Figure 4 of Mikamo.

Thus, the obviousness rejection is flawed under MPEP § 2143: the only possible motivation to provide the limitations of claim 2 comes from the Applicants' disclosure. Moreover, even if Mikamo disclosed an "updated system sector" (which it does not as set forth above), there would be no motivation to combine its teachings with that of Flannagan because Flannagan and Mikamo teach away from each other: Mikamo teaches that the positional information

should be in the data portion whereas Flannagan teaches that it should be in a separate portion. Accordingly, claim 2 and its dependent claims 3 – 9 are patentable over these references

Claim 20 is analogous to the method claim 1 in that it also recites "an updated system sector for accessing only updated data files, the updated system sector being written in the writable area starting from the end of the system sector towards the data area along the spiral track, the information for accessing the data files that were not updated being stored in the system sector." Accordingly, claim 20 and its dependent claims 24 – 26 are also patentable over these references.

Respectfully submitted,

Date: 2/14/05 By: [signature]

Jonathan W. Hallman
Reg. No. 42,622

Claims Appendix

2. A method for emulating an erasable storage medium using a non-erasable optical disk, wherein the optical disk includes a writing area formed in a spiral track, the method comprising:

writing a plurality of data files in the writing area, wherein a first data file is written from a first end of the spiral track, a second data file is written from the end of the first data file on the spiral track, and so on for remaining data files;

generating a system sector for the data files, wherein the system sector identifies, for each data file, its location in the writable area and its size;

writing the system sector in the writable area, wherein the system sector is written from the remaining end of the spiral track;

generating an updated system sector whenever there is a change in the data files stored on the writable area, wherein the updated system sector identifies only the changed data files, the unchanged data files being identified by the system sector; and

writing the updated system sector in the writable area, wherein the updated system sector is written from the end of the system sector on the spiral track.

3. The method of Claim 2, wherein the change is an additional data file being written in the writable area, the additional data file being written from the end of the last data file on the spiral track, and wherein the updated system sector identifies the location and size of the additional data file.

4. The method of Claim 2, wherein the change is a modified data file being written in the writable area, the modified data file being written from the end of the last data file on the spiral track, and wherein the updated system sector identifies the location and size of the modified data file such that the modified data file replaces the contents of a given data file stored in the writable area.

5. The method of claim 2, wherein the change is an indication that a given data file stored in the writable area is to be considered deleted.

6. The method of claim 2, wherein the writable area is contained within an annular area of the optical disk, the annular area having an inner diameter and an outer diameter, and wherein the first end of the spiral track is adjacent the outer diameter and the remaining end of the spiral track is adjacent the inner diameter.

7. The method of Claim 2, wherein each system sector comprises:

a directory identification parameter that is used to determine when to terminate the process of reading the system sector(s).

8. The method of Claim 2, wherein each system sector further comprises:

a file identification parameter that is used to determine when to terminate the process of reading the system sector(s).

9. The method of Claim 2, wherein each system sector includes:

a data block number that indicates the next available writeable location for a data file.

20. A write-once read-many (WORM) optical disk, comprising:

a writeable area on the optical disk, wherein the writable area is formed in a spiral track, the spiral track forming a data area starting at a first end of the spiral track and extending towards the remaining end and forming a system sector starting at the remaining end and extending towards the first end, wherein the data area comprises a plurality of data files and the system sector identifies the location and size of the data files; the writable area including:

an updated system sector for accessing only updated data files, the updated system sector being written in the writable area starting from the end of the system sector towards the data area along the spiral track, the information for

accessing the data files that were not updated being stored in the system sector.

24. The optical disk of Claim 20, wherein each system sector comprises:
a directory identification parameter that is used to determine when to terminate the process of reading each of the system sectors.

25. The optical disk of Claim 24, wherein each system sector comprises:
a file identification parameter that is used to determine when to terminate the process of reading each of the system sectors.

26. The optical disk of Claim 20, wherein each system sector includes:
a writeable data block number that indicates the next available location for a data file.